



Gear Ratio	1:1 Direct Drive		
Color Coding	Blue ring		
Colling System	Single/Internal	Single/External	
Fiber Optic	✓	---	---
Bur Type	ISO 1797-1 Type2 / Ø2.35mm	ISO 1797-1 Type2 Ø2.35mm	
Chuck Type	Switch	Switch	
Max Working Part Diameter	Ø4mm		

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**1. Precautions for Safety of Operation**

Thank you for purchasing Vectormatic Low Speed Handpiece and Motor.

- CAUTION**
- Please consider the safety of the patient when using the products.
  - Please use products carefully to prevent dropping the handpiece on the ground.
  - Please stop using the handpiece immediately when finding any abnormality and send back to your dealer for service.
  - Always maintain the products as recommended by operation manual.
  - Do not try to disassemble or modify the handpiece.
  - Do not try to remove the bur until the handpiece completely stops rotating.

- Do not use non-ISO standard burs and burs which are not specified in Specifications.
- Do not press push button when the handpiece rotating. It will cause a dangerous situations such as the handpiece to overheat and burs may be released accidentally.

**2. User and Intended Use**

User: This product is intended to be used by Dentists and Dental hygienists.  
Intended Use: Dental applications such as restorations preparing, implanting and endodontics etc.

**3. Accessory List**

3.1 Contra-angles			
No.	Part Name	Quantity	Remarks
1	Cleaning Wire	1	
2	E-Type Spray Nozzle	1	
3	Spray Nozzle of chuck	1	A65, A65 L only
3.2 Straight Handpiece			
No.	Part Name	Quantity	Remarks
1	E-Type Spray Nozzle	1	
3.3 Motor			
No.	Part Name	Quantity	Remarks
1	Spray Nozzle	1	

**4. Specifications**

4.1 Contra-angles				
Model	A61 L	A61	H41	VM25LPA 5
Max Rotation Speed (rpm)	40,000min	25,000min	200,000min	

Gear Ratio	1:1 Direct Drive	1:1 Direct Drive	1:5 Increasing
Color Coding	Blue ring	Blue ring	Red ring
Colling System	Single/Internal	Single/External	Quattro/Internal
Fiber Optic	✓	---	---
Bur Type	ISO 1797-1 Type1 / Ø2.35mm	ISO 1797-1 Type3 Ø1.59-1.60mm	
Water Pressure	0.08 - 0.20MPa (0.8 - 2.0 kgf/cm <sup>2</sup> )	---	0.08 - 0.20MPa (0.8 - 2.0 kgf/cm <sup>2</sup> )
Chip Air Pressure	0.10 - 0.20MPa (1.0 - 2.0 kgf/cm <sup>2</sup> )	---	0.10 - 0.20MPa (1.0 - 2.0 kgf/cm <sup>2</sup> )

Max Working Part Diameter	Ø4mm	Ø4mm	Ø2mm	
4.2 Straight Handpieces				
Model	A16 L	A16	A20 L	A20
Max Rotation Speed (rpm)	2,500min		2,000min	
Gear Ratio	16:1 Reduction		20:1 Reduction	
Color Coding	Green ring		Green ring	
Classification Purpose	Endodontic		Implant	
Cooling System	Single/Internal		Single/External	

Chuck Type	Push Button		
Fiber Optic	✓	---	---
Bur Type	ISO 1797-1 Type1 Ø2.35mm Engine File	ISO 1797-1 Type1 Ø2.35mm Surgical Burr/Drill	
Max Working Part Diameter	Ø4mm		

4.2 Straight Handpieces			
Model	A11 L	A11	H11
Max Rotation Speed (rpm)	40,000min		25,000min

**4.3 Air Motors**

Model	A12N	A14N	A16N-D	A16N-L
Max Rotation Speed (rpm)	25,000min			
Hose Connection Type	Borden 2 Hole	Midwest 4 Hole	ISO 9168 Type 3	ISO 9168 Type 3
Handpiece Connection Type	E-Type ISO 3964			
Optic	---	---	LED	Halogen
Cooling System	Internal		Internal	

Cooling Water Supply	50mL/min(0.25MPa)
Cooling Air Supply	1.5L/min(0.25MPa)
Air Consumption	< 50NL/min
Drive Air Pressure	0.20 - 0.25 MPa(2.0 - 2.5 kgf/cm <sup>2</sup> )
Air Pressure	---
Water Pressure	0.10- 0.25 MPa(1.0- 2.5 kgf/cm <sup>2</sup> )

Model	AE2N	AE4N
Max Rotation Speed (rpm)	25,000min	
Hose Connection Type	Borden 2 Hole	Midwest 4 Hole
Handpiece Connector Type	E-Type ISO 3964	
Optic	---	
Cooling System	External	
Cooling Water Supply	---	

Cooling Air Supply	1.5L/min(0.25MPa)
Air Consumption	< 50NL/min
Drive Air Pressure	0.20 - 0.25 MPa(2.0 - 2.5 kgf/cm <sup>2</sup> )
Air Pressure	---
Water Pressure	0.15 - 0.25 MPa(1.5 - 2.5 kgf/cm <sup>2</sup> )

4.4 Burs			
Type	FG	CA	HP

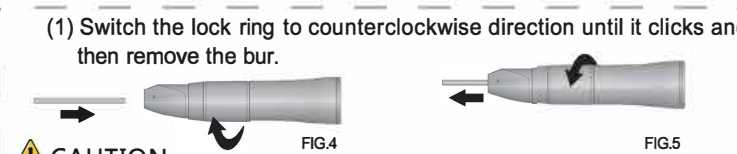
Shank Diameter	Ø1.59-Ø1.60mm	Ø2.334-Ø2.35mm	Ø2.334-Ø2.35mm
Maximum Length	25mm	34mm	50mm
ISO Standard	ISO 1797-1 Type3	ISO 1797-1 Type1	ISO 1797-1 Type2

4.5 Files			
Type	CA	Type	CA
Shank Diameter	Ø2.334-Ø2.35mm	Shank Diameter	Ø2.334-Ø2.35mm
Maximum Length	25mm	Maximum Length	36mm

ISO Standard	ISO 1797-1 Type1	ISO Standard	ISO 1797-1 Type1
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**5. Inserting & Removing the Bur**

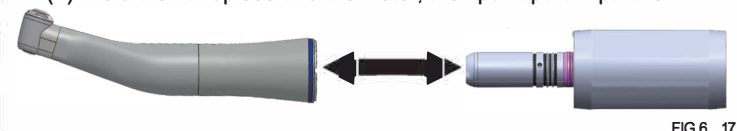
- 5.1 Inserting the FG bur (FIG.1)**
- Press the button and insert the bur fully into the chuck until it stops. Then release the push button.
  - Use hands to pull the bur to check if it is securely attached.
- 5.2 Inserting the CA bur (FIG.2)**
- Insert the bur fully into the chuck without pressing the button.
  - Turn the bur back and forth until it correctly secured in place.
  - Use hands to pull the bur to check if it is securely attached.
- 5.3 Removing the FG/CA bur (FIG.3)**
- Press the push button securely and then remove the bur.
- 5.4 Inserting the HP Bur (FIG.4)**
- Switch the lock ring to counterclockwise direction until it clicks.
  - Insert the bur fully into the chuck then switch the lock ring to clockwise direction until it clicks.
  - Use hands to pull on the bur to check if it is securely attached.
- 5.5 Removing the HP Bur (FIG.5)**
- Switch the lock ring to counterclockwise direction until it clicks and then remove the bur.



- CAUTION**
- Please always follow instructions which provided by bur manufacturers.
  - Do not insert or remove the bur when the handpiece rotating.
  - Do not use non-ISO standard burs and burs which is not specified in "4 Specifications".
  - Do not apply overdose pressure on the bur or it may break and hard to remove.

**6. Connecting and Disconnecting from the Motor**

- 6.1 Connecting(FIG.6)**
- Connect the handpiece with the motor. When connecting an optic handpiece, please make sure it locks into position.
  - Make sure that the handpiece is securely connected to the motor.
- 6.2 Disconnecting(FIG.6)**
- Hold the handpiece and the motor, then pull apart in parallel.



**CAUTION**

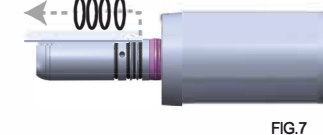
- Please make sure the handpiece and the motor connect tightly.
- Do not connect or disconnect the handpiece until the motor has completely stopped.
- Do not try to connect with other motors except E-type(EN ISO 3964) motor.
- Do not turn the motor while disconnecting the handpiece. Disconnecting during operation might cause damage.

**7. Replacing the O-rings**

Replace the O-rings if you find water present in the exhaust air area. This is

an indication of water leakage within the motor. When this situation happen, please replace the O-rings right away.

- Gently remove the O-rings by proper tools or hand.(FIG.7)
- Insert new O-rings in the correct grooves.
- Check the motor again to make sure it doesn't leak.



**CAUTION**

- Please make sure new O-rings are inserted in correct grooves.
- Do not damage new O-rings while inserting.

**8. Checking the Handpiece before Each Use**

- 8.1 Checking procedure**
- Insert the bur to check the chuck system. ( Refer to "5. Inserting and Removing the Bur").
  - Check the back cap is firmly tightened.
  - Check the cooling water spraying properly.
  - Check noise, heating and vibration while rotating.

**CAUTION**

- Please follow the checking procedure before use. If any abnormal conditions occurred, stop using the handpiece immediately.

**9. Maintenance**

- 9.1 Preparation**
- Wear protective gloves to minimize the risk of infection during reprocessing.
  - Remove the bur from chuck system.
  - Wipe the outside of the handpiece with a 4x4 soaked in Alcohol. Do not use any sort of chemical disinfectant on the handpiece or motor.
  - Disconnect the handpiece from the motor.

- 9.2 Cleaning**
- 9.2.1 Cleaning external surface**
- Clean the debris on the surface of handpiece with cotton cloth soaked in alcohol.
  - Dry the surface of handpiece with clean wiping cloth.

- Dry the internal of handpiece with air gun.

**CAUTION**

- Do not wash/soak/wipe the handpiece in any solution. Water only.
- Do not use ultrasonic bath to clean the handpiece.

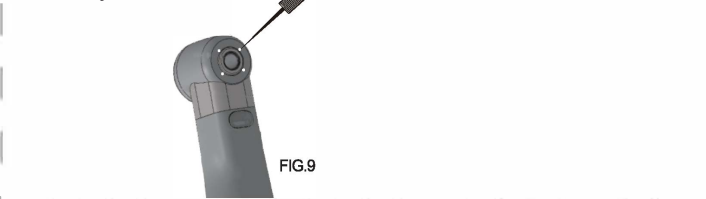
**9.2.2 Cleaning Fiber optic(FIG.8)**

- Use alcohol swab to clean the debris of fiber optic.



**9.2.3 Cleaning Spray port & External tube**

- Use cleaning wire to clean spray port of Contra-angles.(FIG.9)
- Use cleaning wire to clean external tube of Contra-angle handpiece (A20/A20 L). Then, connect with the irrigation tube and wash interior by clean water.



**9.3 Lubrication**

Lubricate handpieces and air motors with Vector Premium Service Oil every time after each use or before autoclaving.

**9.3.1 Lubricate Contra-angle Handpiece**

- Screw the spray nozzle of chuck on the spray can.
- Use a tissue to cover handpiece head and lubricate the chuck for 2-3 seconds until the debris come out of the head.(FIG.10)
- Screw the E-type spray nozzle on the spray can.
- Lubricate the rear of handpiece for 2-3 seconds.(FIG.11)
- Connect the contra-angle handpiece with dental unit and then rotate it until fully lubricated.



**CAUTION**

- Please clean and lubricate the chuck system once a week or it may become dirty and lead to failure.

**9.3.2 Lubricate Straight Handpiece**

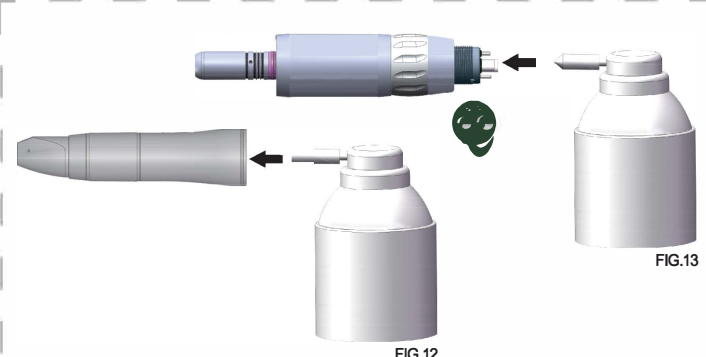
- Screw the E-type spray nozzle on the spray can.
- Lubricate the rear of handpiece for 2-3 seconds.(FIG.12)
- Connect straight handpiece with dental unit and then rotate it until fully lubricated.

**9.3.3 Lubricate Air Motor**

- Screw the correct Spray Nozzle on the spray can.
- Lubricate the drive air port of the handpiece for 2-3 seconds.(FIG.13)
- Connect the air motor with dental unit and then rotate it until fully lubricated.

**CAUTION**

- Be sure to grasp handpieces and air motors securely to prevent sliding from spraying.
- Please keep the spray can upright.



**9.4 Sterilization**

Sterilize the products with autoclave after each use.

- After the Maintenance are completed, place it in autoclave pouch and seal it.
- Cycle as per autoclave manufacturer's instructions. Autoclavable up to 135°C.
- Cool down the temperature of products until it reaches room temperature.
- Store products in the autoclave pouch until next usage.

**9.5 Storage**

Products should be stored and be protected from dust with minimum exposure to germs in a dry, dark and cool area.

**10. Symbols**

- This product is sterilizable up to Max. 135 °C.
- This product can be washed via Thermo Disinfector.
- Conforms to CE European Directive of "Medical Device Directive 93/42/EEC".
- Manufacturer.
- Authorised representative in the European community.

**11. Warranty**

Vector R & D inc. warrants its products to the original purchaser against defects in material and workmanship under normal practices of installation, use and service. The warranty time is 1 year from the invoice date of purchase. If claims proved, Vector R & D or its authorized agent has the obligations to provide free repair or replace of the product. Damage caused by human factors is not within the scope of warranty. In order to meet the warranty and compensation term, any returned products must be indicated with the date of purchase, product type, invoices or shipping records. Vector reserves the right to make the final decision on warranty.

**NOTICE**

- Vector R & D. has no responsibility for damage or problem caused by the following factors.
- Excessive operation.
  - Incorrect operation.
  - Without following the manual instruction to install, operate or maintain.
  - Influenced by the unusual chemical, electrical or electrolyte substance.
  - Air, water hose or electrical wire are connected mistakenly.

**12. Disposal**

- All of the products does not contain any substances which are hazardous to the environment.
- Disinfect the products prior to disposal.
- Please observe the medical disposal regulations applicable in your country.

**EC REP**

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